ginia and Florida. In these States even a slight deficiency in monthly mean temperature occurred at a few places, as at Key West (−0.4°) and Richmond (−0.1°).

The mean temperature for the entire district determined from all records was 79.7° and the average excess +2.3°. June, 1911, was nearly 5° warmer than June, 1910. The State averages ranged from 74° for the Virginia area and 78° for North Carolina to about 81° for all other States in the district. The highest local monthly mean was 84.6° at Blakely, Ga., and the lowest was 66.4° at Hot Springs, Va. The highest temperature for the district was 109° at Kings Mountain, N. C., on the 11th, closely followed by 108° at Blakely, Ga., on the 16th. The maximum at Blakely stands as the record for Georgia, equaling the highest ever registered throughout the year. The same maximum occurred at only three other stations, namely, at Cordele on July 25, 1893, at Quitman August 11, 1896, and at Hephzibah July 6, 1902. The lowest temperature in the district was 44° at Hot Springs, Va., on the 1st. At Mineral Bluff, Ga., and Hamilton, Ala., a minimum of 48° was registered on the 13th. Last year the minimum temperatures in June were as low as 35° in Virginia and 39° in northern Georgia.

PRECIPITATION.

The fact that June was a very dry month in several States in the district is indicated not only by the considerable deficiencies in precipitation, as shown by the departures from the State normals, but also by the unusually low stages in the rivers, necessitating a restriction in the use of water by the inhabitants of some cities and causing a serious curtailment of the water supply available for power purposes. The rainfall was very irregularly distributed and the amounts were generally small, but the number of days with appreciable rainfall, even in the driest States, was not much below the normal, nor were there long periods of consecutively dry days except at a few individual stations. The number of days with rain for the district as a whole was 9, ranging from 7 for South Carolina to 10 for Virginia. In all sections after the 17th rains were more frequent and some large amounts were received.

The State averages ranged from 2.78 inches for Georgia to 5.01 inches for the Mississippi area. Although the greatest deficiency, 2.32 inches, occurred in Florida the frequency of light rains prevented drought from becoming marked in that State and likewise in Virginia, Alabama, and Mississippi. For Gerogia, South Carolina, and North Carolina the deficiencies averaged about 2 inches and in portions of these States the drought was severe. In North Carolina and Georgia June, 1911, was the driest June on record, with two exceptions, in a period of over 25 years, and at a few places no rain fell for more than half the month.

The regions of heaviest rains were confined to very limited local areas in each State, almost contiguous to others receiving very small amounts. Thus a single station in Virginia received over 7 inches, Williamsburg, 7.42 inches; in South Carolina the largest amount was 10.89 inches, at Dillon; Fort Myers, Fla., received 8.77; Prattville, Ala., 7.52, and Monticello, Miss., 7.74 inches. The regions of least rainfall embrace portions of western North Carolina, northwestern South Carolina, and north-central Georgia, extending from the upper waters of the Savannah southwest to the mouth of the Chattahoochee River.

The average rainfall for the entire district was 3.73 inches, and the departure −1.30 inches. The largest amount received was 10.89 inches, at Dillon, S. C., and the least, 0.11 inches, at Randolph, Va., closely followed by Point Peter, Ga., with 0.31 inch. The greatest amounts in 24 hours were 4.22 inches, at Kissimmee, Fla., on the 8th, and 4.13 inches, at Columbia, S. C., on the 19th and 20th. Amounts exceeding 2.50 inches in 24 hours occurred at comparatively few places in each State.

RIVER CONDITIONS.

The rivers throughout the district remained at very low stages during the month and the monthly means were much below the normal. In many cases the rivers were as low as they usually are in October or November, and gave the minimum stages ever recorded at any time of the year. This was especially the case in the Chattahoochee and Flint Rivers in Georgia. At Eufaula, Ala., on the Chattahoochee, the mean stage for June, 1911, was 0.2 foot; the normal stage for the month, based on records for the past 17 years, is 4.4 feet. The lowest river reading was −2.3 feet on June 20, 1911, while the previous lowest stage was −1 foot on September 24, 1905. The flood stage at this station is 40 feet. At Albany, Ga., on the Flint River, the mean stage for the current month was −0.3 foot; while the normal stage, based on records for 17 years, is 3 feet. The lowest stage this month was −1 foot, on the 20th and 21st, as compared with a previous low stage of −0.9 foot on October 9, 1895. The flood stage is 20 feet. The Santee River in South Carolina was very low at Ferguson and Rimini. The normal stages for June at these points are, respectively, 11.3 feet and 11.4 feet, while the mean stages for the current month were 3.8 feet and 3.4 feet. At both points the lowest stages observed since 1907 occurred.

On account of the very dry weather in the basin of the Savannah River above Augusta the water in the Augusta canal diminished so greatly that it became necessary to cut off the supply from some of the consumers of water. It was also necessary to shut down the gates and fill the canal at night in order to partially supply the demand for power during the day. This process was repeated each night in order to keep the head of water as high as possible. Heavy rains on the 18th restored normal conditions.

MISCELLANEOUS PHENOMENA.

The prevailing winds were from the west or southwest in all portions of the district. The wind movement was quite small, the average velocity for the month exceeding 10 miles an hour only at Hatteras, Savannah, and Pensacola. Gales of 40 miles or more an hour occurred at Norfolk, 42 south, 12th; at Savannah, 46 north, 7th; Jacksonville, 48 southwest, 2d; Tampa, 42 southeast, 17th, and Pensacola, 50 east, 3d.

The amount of sunshine was above the normal in most sections. The average number of clear days was 15, ranging from 13 in Alabama to 16 in Mississippi; the average number of partly cloudy days was 10 and cloudy days 5.

THE DROUGHT OF 1910–11 IN NORTH-CENTRAL GEORGIA AND THE CHATTAHOOCHEE RIVER BASIN.

The long period of dry weather in June, 1911, in north-central Georgia, during which no appreciable precipitation fell at several stations for 15 to 20 consecutive days, and the fact that the lowest river stages ever recorded were attained at points on the Chattahooche and Flint

Rivers, invite renewed attention to the general deficiency of rainfall that has prevailed in the east Gulf States for several years and which has been so sharply accentuated during the past 12 months. The following brief investigation may be of general interest.

The number of consecutive days without rain during June, 1911, at a few stations in Georgia, the period beginning with the first of the month, together with the total rainfall for the month and departures from the normal, were as follows:

Station.	Duration of drought days.	Total rainfall for month.	Departure from normal.
Atlanta	15	1.09	−2.90
Canton	17	2.08	−1.59
Point Peter	17	0.31	−4.26
Carlton	18	0.32	−5.37
Clayton	19	3.13	−2.84
Putnam	19	1.30	−2.27

For the purpose of making a comparison with the conditions of former years, the regular station at Atlanta having a record extending from 1879 to 1911, may be selected as representative. The following table gives for Atlanta the number of periods, consecutively dry for 15 days or more, for each month during 33 years. In making the computation a trace of precipitation was not considered to interrupt the dry period. The first column in the table gives the length of the dry periods in days, and the figures in the body of the table give the number of such periods on record. The dates of occurrences of these dry spells are given in the tabulation following the table.

TABLE I.—*Number and duration of consecutive dry periods at Atlanta, Ga., 1879–1911.*

Duration in days.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
15	1		1		2	3		1	1	1	2	
16						1				2	1	1
17					1		1		3	3	1	
18					2				1	1	1	
19	1								2	1		
20					1				1			
21									2	2	1	
22									1	1		
23												1
24			1									
25												
26										1		
27									2			
28												
29												
30										1		
31												
32												
33										1		

DATES OF PERIODS OF 15 DAYS' DURATION OR MORE.

January:
15 days, 1892, 21–Feb. 4.
19 days, 1902, Dec. 30, 1901–Jan. 17.

March:
15 days, 1907, 16–30.
24 days, 1910, 12–Apr. 4.

May:
15 days, 1896, 6–20; 1898, 7–21.
17 days, 1906, 8–24.
18 days, 1897, 15–June 1; 1901, Apr. 24–May 11.
20 days, 1879, 19–June 7.

June:
15 days, 1881, 10–24; 1887, 5–19; 1911, 1–15.
16 days, 1894, 1–16.

July:
17 days, 1893, June 27–July 13.

August:
15 days, 1893, 15–29.

September:
15 days, 1879, 15–29.
17 days, 1882, 12–28; 1892, 21–Oct. 7; 1900, 16–Oct. 2.
18 days, 1884, 13–30, and continued to Oct. 21, 39 days.
19 days, 1903, Aug. 25–Sept. 12; 1910, 9–27.
20 days, 1908, 6–25.
21 days, 1895, 16–Oct. 6; 1903, 17–Oct. 7.
22 days, 1897, Aug. 31–Sept. 21.
27 days, 1896, Aug. 26–Sept. 21; 1904, 5–Nov. 1.

October:
15 days, 1895, 13–27.
16 days, 1892, 9–24; 1909, Sept. 24–Oct. 9.
17 days, 1881, 2–18; 1887, Sept. 30–Oct. 16; 1897, Sept. 24–Oct. 10.
18 days, 1910, 9–26.
21 days, 1884, 1–21, preceded by 18 days in Sept., 39 days; 1901, 14–Nov. 3.
26 days, 1886, Sept. 29–Oct. 24.
30 days, 1904, 3–Nov. 1.
33 days, 1891, 3–Nov. 4.

November:
15 days, 1890, 18–Dec. 2; 1908, 15–29.
16 days, 1897, 10–25.
17 days, 1906, Oct. 25–Nov. 10.
18 days, 1888, 21–Dec. 8.
21 days, 1882, Oct. 23–Nov. 12.

December:
16 days, 1896, 19–Jan. 3, 1897.
23 days, 1889, Nov. 28–Dec. 20.

It will be seen at a glance that the June drought of the present year was not unprecedented; nevertheless during summer only 6 periods of dry weather of 15 days duration or more have occurred during the past 33 years. At other seasons of the year, especially in autumn, droughts of much longer duration have prevailed. On account, however, of the intense heat and glaring sunshine usually associated with dry weather in summer, and the consequent rapid evaporation at a time when vegetation requires an abundant supply of moisture for transpiration, summer droughts are invariably more disastrous than the longer droughts of autumn.

The long periods of pleasant, dry weather in autumn at Atlanta are particularly noteworthy and rather unexpected in a region having a normal annual rainfall of nearly 50 inches well distributed through the year. The longest period of consecutive dry days was that which prevailed in 1884, from September 13 to October 21, or 39 days. There have been 51 periods of dry weather at Atlanta of 15 days duration or more, 10 during the first 5 months of the year, 6 during the summer months, and 35 in autumn. The average interval between rains, which is 3 days in February increases to nearly 7 in September and October.

It is frequently the case that a period of drought, entire absence of rain, is preceded and followed by very light precipitation, having hardly an appreciable influence on vegetation, and the duration of drought may correctly be extended to include dates with small amounts of precipitation if in the aggregate they do not exceed, say, half an inch. The following are a few of the most remarkable records at Atlanta:

1904, September 5 to November 1, 58 days; 1 day with 0.10 inch.
1884, August 10 to October 21, 73 days; 9 days with a total fall of 0.28 inch.
1886, September 13 to November 11, 60 days; 7 days with a total fall of 0.43 inch.
1891, September 14 to November 9, 57 days; 6 days with a total fall of 0.18 inch.
1897, August 31 to October 10, 41 days; 2 days with a total fall of 0.14 inch.

That the past 12 months have been remarkably dry at Atlanta is shown in the clearest manner by the following summary and comparison of the total precipitation in periods of 6 months, July to December, and January to June, during years of least rainfall:

July to December.			January to June.		
Year.	Total rainfall.	Departure from normal.	Year.	Total rainfall.	Departure from normal.
1884	14.19	− 8.83	1887	15.21	−11.13
1886	13.35	− 9.67	1890	18.92	− 7.42
1893	13.94	− 9.08	1894	18.90	− 7.44
1908	14.40	− 8.62	1896	14.64	−11.70
1910	12.73	−10.29	1898	15.09	−11.25
			1904	15.46	−10.88
			1911	15.38	−10.96

The total rainfall for the 12 months from July, 1910, to June, 1911, was 28.11 inches, indicating a remarkable deficiency of no less than 21.25 inches, or 43 per cent, of the normal annual rainfall. A similar remarkably dry period occurred from July, 1886, to June, 1887, when the total for the period was 28.56 inches.

Passing to the larger area comprising the watershed of the Chattahoochee River the same condition is seen to be general. The normal rainfall for the Chattahoochee Basin computed from the records at 9 well-distributed stations is compared below with the average rainfall for the same stations for the period from July, 1910, to June, 1911.

Normal precipitation over the Chattahoochee Basin.

Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
4.44	5.87	5.42	4.14	3.52	4.39	5.29	5.46	3.55	2.64	2.99	5.06	52.77

JANUARY TO JUNE, 1911, AND JULY TO DECEMBER, 1910.

3.47	2.81	2.65	5.56	2.38	2.32	5.82	3.74	2.72	2.52	1.60	3.89	38.98

A moderate excess in rainfall occurred over the basin in July, 1910, and in April, 1911, but the deficiency for the past 12 months was 13.79 inches. For a long time the Chattahoochee River has been very low, resembling its normal flow in September or October, and it has responded very slightly to occasional increase in rainfall over its basin. The lowest stages in the past 17 years occurred at Eufaula, Ala., on the Chattahoochee, and like conditions prevailed at Albany, Ga., on the Flint River, over the basin of which similar drought conditions prevailed.